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MOUTH HYGIENE AND ITS RELATION TO HEALTH

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There is not any one single thing more important to the public in the whole range of hygiene than the hygiene of the mouth. If I were asked to say whether more physical deterioration was produced by alcohol or by defective teeth, I should unhesitatingly say defective teeth.—*William Osler, M. D.*

There is probably no people who, as a whole, give as much attention to mouth hygiene as do Americans, and though their susceptibility to dental diseases is high, it is not higher than that of other nations who exercise little or no care. One explanation of this high susceptibility will be found in the enormous amount of sugar which we consume as a nation, reported in 1906 as being 6,450,653,967 pounds, or about 92½ pounds per capita, fifteen pounds higher than that of Great Britain, our closest competitor. And yet, with all our boasted pre-eminence, we are as a nation lamentably ignorant of the first principles of what constitutes mouth hygiene.

Nor are we one whit less ignorant regarding the pernicious effect of mouth infection upon our national health. It has been said that nowhere in the human body will so much filth be tolerated as in the mouth, the avenue through which must pass all food, upon which depends the nourishment of the body and the maintenance of health.

The number of people in the United States, who patronize the dentist, except for the occasional extraction of a tooth, has been variously estimated at from four to ten per cent. If these figures be true, it means that there are not less than seventy-five million people in this country who give little or no attention to mouth hygiene.

Under the most favorable conditions the mouth may be regarded as being an almost ideal culture medium for germ life. In fact, it presents in point of temperature, moisture, nutritive material, etc., an almost perfect breeding-place. Upward of twenty varieties, many of them pathogenic (disease-producing) in their nature, have been found to be normal residents of the mouth under certain conditions. Among these may be mentioned the streptococcus and

staphylococcus, both pus producers, and always present in the mouth in greater or less numbers, the pneumococcus, the causative agent in pneumonia, and also a frequent resident of the mouth, the dreaded tubercle bacillus and Vincent's fusiform bacillus, only to mention a few of the more virulent types. One investigator who has given years to the study of mouth bacteria has estimated the number of germs in one unclean mouth at 1,140,000,000.

Many of the diseases of the mouth are directly or indirectly caused through the agency of these germs. Fortunately, for humanity, nature has provided the mouth with soft tissues that are unusually resistant to infection. Every one knows that a wound in the mouth, such for example as that caused by the extraction of a tooth, rarely becomes infected, notwithstanding the fact that it may be constantly bathed with organisms that under other circumstances might cause serious infection. It is true that fatalities from such causes are not unknown when for some reason the resistance to infection is low, but they are comparatively rare.

While the local penalties attached to an unsanitary mouth are sufficiently grave to warrant serious consideration, they are as nothing to those which they inflict upon the general health. We have too long considered the mouth as an independent entity, forgetting that here it is that the first steps in digestion are taken—the only steps, in fact, over which we have the slightest control. Not only is it important that food be thoroughly masticated, which is impossible without sound and healthy teeth, but it is equally important that the mouth in which mastication takes place be a clean mouth.

Factors in an Unclean Mouth. Among the factors which make for an unclean mouth may be mentioned caries of the teeth, pyorrhea alveolaris or so-called "Riggs Disease," chronic abscesses, commonly called ulcerated teeth, or gum boils, irregular or mal-posed teeth, partially erupted "wisdom teeth," deposits of salivary tartar, inflamed and bleeding gums, the habitual use of tobacco, ill-fitting artificial teeth, such as crowns, bridges, plates, etc.

Decay of the Teeth. Of all these, the most common, and probably the most pernicious in its effect upon the hygiene of the mouth, is caries of the teeth. So nearly universal an affection is this that it has been characterized "The Peoples' Disease." Few individuals or nations escape its ravages. So far as is at present known, the Esquimaux, certain tribes of American Indians, the Icelanders, the

Lapps, the Igorots (all more or less completely outside the influence of civilization) are the only people who are more or less exempt from dental caries.

Like many another disease, it is brought about through the agency of micro-organisms, and in this instance micro-organisms resident within the mouth. These germs possess the property under favorable circumstances of converting carbohydrates (starchy foods, sugars, etc.) into acids, which in turn dissolve out the lime salts of the enamel, and this notwithstanding the fact that the enamel is the hardest tissue within the body, not less than 97 per cent. of it being inorganic.

The rapidity with which this phenomenon is accomplished will depend upon the number of organisms present, the cleanliness or uncleanness of the mouth, and the resistance which the teeth, or the body as a whole, offers to their activity. Once the solution of the enamel has taken place, and the dentine, containing 28 per cent. of organic material, is exposed to the combined influence of germs and acid, the progress of the disease becomes more rapid, it being then only a question of time, unless interfered with, when the pulp of the tooth becomes involved, followed by pain, death of the pulp and eventual loss of the tooth. Thus it will be seen that the progress of the disease is comparatively slow, that decay which has progressed to the point of pain is not a matter of days or weeks, but rather of months or years. An aching tooth does not spring into being in a day, and means nothing less than negligence long continued. While caries of the teeth is not limited to any age, and may afflict any one between infancy and old age, it is, nevertheless, essentially a disease of childhood, its most active period being between the ages of six and twenty. If its ravages could be prevented during this active period, the dental ills of adult life would, with proper care, be very materially reduced. The menace in bad teeth cannot but be apparent to any one who has given the subject any consideration whatever, and especially is it pernicious in its influence upon the health and efficiency of the growing child. Decaying teeth render thorough mastication impossible, and establishes early in life the habit of bolting the food—a habit which may continue throughout life. Moreover, the filth which is inseparable from decaying teeth and neglected mouth hygiene is mixed with the food, and carried into the stomach as a further tax upon the digestive apparatus. In

a word, decaying teeth, especially in the mouth of a child, spells poor nutrition, and poor nutrition means poor health and a low order of efficiency.

Pyorrhea Alveolaris (Riggs Disease). If decaying teeth is essentially a disease of childhood, pyorrhea alveolaris may be said to be essentially a disease of adult life. Among adults, in some form, it is very common, and is responsible for the loss of many otherwise healthy teeth, and the indirect cause of not a few ills more or less seriously affecting general health. The disease attacks the tissues supporting the teeth, involving the pericemental membrane, bony socket and gums, and is characterized by loosening of the teeth, inflammation and recession of the gums, necrosis of the bony walls surrounding the teeth, and, in most instances, a discharge of pus at the free margin of the gums. This discharge is more or less persistent, the amount depending upon the number of teeth involved, the advanced stage of the disease and the nature of the infecting organisms. In its early stages there is little to attract the attention of the patient. It is only when the disease becomes well advanced on one or more of the teeth that the patient's attention is attracted to it. Then it is that there will be noticed a slight loosening of the affected teeth, with possible elongation, sensitiveness to heat and cold, sweets and acids; pain on mastication; periodic and painful swelling of the gums, due to infection, etc. One or all of these symptoms may be present, their severity depending largely upon the stage of the disease. Pyorrhea alveolaris, is, first, last and all the time, a filth disease, encouraging the growth of pyogenic (pus-producing) organisms, permitting the lodgment of particles of food between the loosened teeth, and discharging its purulent matter into the mouth with every act of mastication. A condition such as this means not only an unclean and unhealthy mouth, with ultimate loss of the teeth, but means also eventual impairment of the health. As a causative factor in gastro-intestinal diseases, pernicious anemia and arterio-sclerosis (hardening of the arteries)—only to mention some of the more obvious results of mouth infection—pyorrhea alveolaris has never received the attention which its importance demands. If its presence in the mouth were a matter of weeks or months only, its effect upon general health might be ignored, but when it is remembered that not infrequently it may, because of its chronic nature, persist almost throughout adult life,

and that without more than occasional painful symptoms, one is made to realize that it is a disease which merits serious consideration.¹

Chronic Alveolar Abscesses. Perhaps the third most potent factor in an unclean mouth is alveolar abscesses, commonly referred to as ulcerated teeth, or gum boils. These are common to all ages, from the time the temporary teeth are erupted and as long as any teeth remain. They are always, with rare exceptions, caused through a neglect to properly care for a decaying tooth in its early stages. Decay having been allowed to progress from its early manifestations through various stages until the pulp, situated in the center of the tooth and root, and containing arteries, veins, nerves and connective tissue, becomes involved by the germs of decay; death of the tooth follows. Unless recognized, and proper treatment instituted, gangrene of the pulp takes place, followed by a discharge of the products of decomposition through the end of the root into the surrounding tissues.

Infection takes place, followed in most instances by acute pain, elongation of the affected tooth, swelling of the face, and eventual discharge of pus, usually within the mouth. These symptoms last two or three days, and are accompanied by an elevation of temperature, loss of appetite, digestive disturbance, etc. With the discharge of pus, the acute symptoms subside, and all that remains as evidence of the abscess is the opening through which the pus discharged itself. Occasionally this occurs without pain, but in both instances the results are the same, viz., a chronic sinus or gumboil, which, as long as the cause remains, will continue to discharge. As the point of discharge is usually within the mouth, this discharge, accompanied as it is with virulent pus-producing organisms, usually the streptococcus, finds its way into the stomach, to be resorbed into the circulation. Treatment consists in the removal of the gangrenous tooth pulp, disinfection of the roots, and filling of the tooth. Such abscesses are very common among children as a result of the decay of their temporary teeth, eight of which are not succeeded by their permanent successors until the twelfth year. Right here let it be said with all possible emphasis that these temporary teeth should be preserved against decay until such time as they are succeeded by the permanent teeth, not only to insure against abscesses, but for the purpose of providing the developing child with an efficient masticating

¹ See *International Clinics*, Vol. 3, page 77.

apparatus. How often is one told that because these are temporary teeth they are entitled to no consideration, with the result that their loss is looked upon with indifference. No greater mistake could be made, for it means not only an unclean and diseased mouth at a critical period in the life of the child, but it means inevitable irregularity of the permanent teeth. Abscesses such as these are very common, even among people who give more or less care to the hygiene of their mouth. In their chronic form they cause little or no pain; the discharge at any one time is small, and their presence is viewed with unconcern. As a result, they are allowed to remain year after year, discharging their poisonous products into the mouth—only one of the several agencies which contribute to its uncleanness.

Other Factors Which Make for an Unclean Mouth. Among the other causes which interfere with mouth hygiene may be mentioned irregular teeth, ill-fitting artificial teeth, salivary tartar, the habitual use of tobacco, etc. If for no other reason than that it contributes to mouth hygiene, teeth that are markedly irregular should be placed in their normal positions. With modern facilities, this can be done without in the least interfering with the health or vocation of the child. Such treatment not only adds greatly to the appearance, but renders the teeth less susceptible to decay.

Because people are prone to regard artificial substitutes for teeth quite as satisfactory in the mastication of food as natural ones, and less liable to cause pain, they have neglected the care of their own teeth, and filled their mouth with all manner of crowns, bridges and plates, forgetting that with each addition of this kind, especially non-removable appliances, they have only increased the difficulties in the way of a clean mouth. By actual comparison artificial teeth have been found to be ten times less efficient in the mastication of food than are sound natural teeth. They sustain about the same relation to natural teeth that a wooden leg does to one of flesh and bones. Moreover, their esthetic value is always low. Great care should, therefore, be exercised to preserve one's own teeth, not only because it is easier to keep natural teeth clean, but because of their greater efficiency as organs of mastication.

If no other charge could be brought against the habitual use of tobacco other than that it contributes to the uncleanness of the mouth, it would be enough to condemn its use. The belief, shared

by so many, that it preserves the teeth against decay is without foundation. Its effect is to discolor the teeth, to add to the general uncleanness of the mouth, and to injure the gums and mucous membrane of the mouth and throat. Smoking, especially pipe-smoking is the most common cause of leucoplakia of the mouth, a disease which is always dangerous because of its tendency to break down and become malignant.

Some of the Systemic Effects of Mouth Infection. In a word, then, decaying teeth, pyorrhea alveolaris, chronic abscesses, irregular teeth, tobacco, artificial substitutes for teeth, etc., are, one and all, prejudicial to mouth hygiene. Moreover, only when it is realized that not only may one, two or three of these agencies of filth be present in any given mouth, but that they may all be present at one and the same time, is one able to appreciate the possible ill effects of such conditions upon the health of the individual. Some of the ways in which the pathogenic organisms of the mouth gain entrance to the body, with possible serious results, may be enumerated as follows:

1st. Infections caused by a breach in the continuity of the mucous membrane of the mouth, brought about by mechanical injuries, wounds, extractions, etc. These lead either to local or general disturbances.

2d. Infections through the medium of gangrenous tooth pulps. These usually lead to the formation of abscesses at the point of infection, but also occasionally to secondary septicemias and pyemia, with fatal termination.

3d. Disturbances caused by the resorption of poisonous waste products formed by bacteria.

4th. Pulmonary diseases caused by the inspiration of particles of slime, small pieces of tartar, etc., containing bacteria.

5th. Excessive fermentative processes and other complaints of the digestive tract caused by the continual swallowing of microbes and their poisonous products.

6th. Infections of the intact soft tissues of the oral and pharyngeal cavities, whose powers of resistance have been impaired by debilitating diseases, mechanical irritations, etc.²

Nor should there be overlooked, in this connection, the possibility of an infection by the accumulation of the excitants of diphtheria, typhus, syphilis, etc., within the mouth itself. That the rela-

² "The Micro-Organisms of the Human Mouth," P. 274.

tion existing between an unclean mouth and other complaints has not long ago been emphasized, is explained by the fact that the mouth, as a source of disease, has never received the attention which its importance deserves, and though there are some who at present recognize this relation, there are many more who give it no consideration whatever.

In the introduction to his book on "Oral Sepsis as a Cause of Disease," William Hunter, M. D., F. R. C. P., has this to say relative to the influence of an unclean mouth upon the health of the body as a whole: "I desire here to point out how common a cause of disease it is, how grave are its effects, how constantly it is overlooked, and what remarkably beneficial results can be got from its removal. What I wish to emphasize is that it is not the stomatitis, or the dental caries, or the absence of teeth, or any disturbance of nutrition in connection with defective teeth that causes all these effects. The condition in one and all is that of profound sepsis; that is to say, we are dealing with pus-forming organisms which are constantly present in the mouth in connection with necrosed teeth."

He sums up his observations regarding the influence of such conditions upon the health of the individual in the following words:

(1) The condition of mouth, associated with the presence of decayed teeth and rotten fangs, is not simply a want of teeth, but is a condition of profound sepsis; and that, too, irrespective of any pain or discomfort they may have from time to time caused, or even of the entire absence of such pain.

(2) The sepsis, moreover, is one differing from ordinary surgical sepsis, inasmuch as all the pus organisms are continuously being swallowed, probably over a period of many years.

(3) Further, it is a sepsis connected with diseased bone (*i. e.*, tooth) than which there is no more virulent form.

(4) While the gastric juice has fortunately a great capacity for killing organisms this capacity is not complete even in health, in the intervals between food when the acidity of the juice is at a minimum.

(5) The continuous influx of pus organisms from diseased teeth and gums must be a source of disturbance to the mucosa, causing catarrh and diminished gastric secretion.

(6) When we have diminished acidity of gastric juice, with increased influx of organisms, we have the two conditions—diminished resisting power and increase of dose—which all pathological knowledge shows to be the two chief conditions underlying infection.

(7) Consequently, the gastric catarrh becomes really a septic catarrh, due to invasion of the mucosa with septic organisms.

(8) Further, apart altogether from its gastric effects, a continued production of pus in the mouth must be a source of danger in other ways.

(9) The mere septic absorption from such teeth and gums must be very considerable, lasting as it does over many years.

(10) The sallow look and languid feelings of which the patient complains, and which he and his physicians agree in referring to his chronic indigestion, are really the expression of this septic absorption.

(11) If pus organisms are constantly being swallowed there is a risk of their infecting the tonsil over which they must pass, and hence tonsillitic, pharyngeal and Eustachian tube infection may from time to time occur.

(12) Even apart from such local effects there must always be a certain risk connected with the absorption into the blood of such organisms from fungating gums around diseased teeth; and, if other conditions are favorable, there may be infection from the blood—*c. g.*, ulcerative endocarditis, empyemata, meningitis, osteomyelitis, etc.

(13) In short, while every care has been and is being taken in increasing degree to protect the public from notorious disease-producing organisms, such as typhoid or tubercle bacilli, whether in the air it breathes, the food it takes, the water it drinks; and the utmost care is even taken by habits of cleanliness or stringent surgical precautions to protect any introduction of ordinary septic organisms by the skin—the mouth alone is disregarded and the patient is left with a permanent condition of sepsis, which, did it exist in any other part of the body, would at once receive immediate attention.

Regarding the influence of mouth sepsis upon the respiratory apparatus, Wadsworth says:³ "From the hygienic standpoint, the secretions of the mouth constitute the chief, if not the only, source of respiratory infections, and this infectious material is transferred from one person to another, in some cases through the air, as from sneezing or coughing, and to an even more serious extent by personal contact, or by the use in common of the various accessories of life."

The Prevention of Mouth Diseases. To cure disease has been characterized as the voice of the past; to prevent it as the divine whisper of the present.

People are everywhere coming to understand that most of the diseases affecting mankind are, to a considerable extent, preventable diseases, and are turning deaf ears toward the voice of the past, while intently listening to the whispered voice of the present.

Prevention of Caries. Perhaps in nothing is the ounce of prevention of more value than in the treatment of dental diseases.

³ *Infectious Diseases.* Oct., 1906.

Just how far caries of the teeth can be prevented, it is impossible to say.

There are individuals who are immune in spite of neglect, just as there are individuals whose teeth decay, because of a high susceptibility, in spite of every care, clearly proving that there are other factors than cleanliness to be considered in the prevention of the Peoples' Disease."

There is one thing, however, which may be regarded as axiomatic—the cleaner is the mouth, the less subject will the teeth be to decay, other things being equal. Dr. Ch. L. Quincerot⁴ says on this point: "Etiologically, an unclean condition of the oral cavity is the principal factor in the production of dental caries. While admitting that a certain number of predisposing factors, such as sex, age, constitution, heredity and defects of structure, aggravate the production of caries, in the majority of cases uncleanness is the initial cause."

In the prevention of caries, obviously, the first requisite is a clean mouth. To accomplish this, the teeth should be brushed with a carefully selected brush, at least twice daily, with a dentifrice the ingredients of which are known. Too many people are willing to use a dentifrice solely on the recommendation of the manufacturer, who probably knows nothing of what is required in such a preparation, and whose only interest is in the profits.

Most of the toothbrushes upon the market are poorly adapted to the proper cleansing of the mouth and teeth, being too large and of improper shape. A small brush of good quality and medium stiffness should be employed. The teeth should be brushed in an up-and-down direction, never across, allowing the brush to pass well up over the gums on the external surface of all the teeth. The mouth should then be opened, and the grinding surfaces of the teeth thoroughly brushed, especial care being given to those in the back part of the mouth. Then, by tilting the brush, cleanse the inner surfaces of the teeth, again allowing the brush to come against the gums in the form of a massage. The tongue should then be extended from the mouth and carefully brushed. After meals, whenever possible, the mouth should be flushed with warm water and the teeth brushed, for the purpose of removing particles of food. The waxed silk, or, better, the waxed silk tape more recently placed on the market,

⁴ *Le Monde Dentaire*, Paris, Jan., 1909.

should be passed back and forth between the teeth, not only for the purpose of removing particles of food which may have wedged between them, but for the purpose of breaking up the small gelatinous plaques which form in these spaces, and under cover of which the micro-organisms carry on their tooth-destroying activities.

The busy man will raise the objection that all this takes time. So it does, and so does anything that is worth while. But it will also save time. To prevent teeth from decaying will always consume less time than does the repairing of them. Moreover, it will pay 100 per cent. in comfort, health and masticating efficiency, not to mention the saving in dental bills. It is not half so much reparative dentistry that the public is in need of to-day as it is preventive dentistry.

Another potent factor in tooth decay is the lack of exercise given the teeth in mastication. One has only to observe the people in a public dining-room to be impressed with how little *real* use is made of the teeth. The way in which food is now prepared has much to do with this, but decaying teeth, lack of teeth, and habit have more. Good, vigorous use of the teeth in the mastication of food not only goes a long way toward keeping them clean, but it also adds appreciably to their immunity from decay.

Viewed solely in its relation to mouth hygiene, the gospel of physiological mastication, so ably preached by Horace Fletcher, is one which could be practiced by every one with increasing benefit. A high standard of health will also operate in reducing the susceptibility to caries of the teeth.

It must not be inferred from the foregoing that caries of the teeth can be entirely prevented. Unfortunately, we can only hope in cases of great susceptibility to limit the disease. The family dentist will still remain a family necessity, but his services should be sought not alone for the purpose of repairing the devastating effects of this disease, but as a supplemental aid in its prevention. Caries, like most of the other diseases of the mouth, can, in its incipiency, be easily and effectually arrested, and this without in the least impairing the usefulness of the teeth as organs of mastication, hence the importance of discovering its presence early. Until the laws governing susceptibility and immunity to disease are better understood than they are at present, frequent visits to the dentist in the interest of prevention should, therefore, be encouraged.

Pyorrhea Alveolaris—Its Prevention. Like caries of the teeth, pyorrhea alveolaris can, to a considerable extent, be prevented, providing proper attention is given to mouth hygiene. In fact, its prevention is more certain than is that of caries. Its causes are many; among them being irritation at the free margin of the gums, wedging of food between the teeth, tartar, poorly fitting artificial crowns, general uncleanness of the mouth, overuse or disuse of the teeth, irregular teeth and certain systemic conditions which predispose to the disease.

Its progress is slow, and in its beginning it is easily cured. In fact, it may be said to be always curable so long as there remains sufficient tissue to support the teeth after the disease has been eradicated. This is emphasized here because it is so often said to be incurable, and so often believed to be true. Its influence upon the health is always bad, though not always obvious.

The Chronic Abscess—Its Prevention. The chronic alveolar abscess, above described, could be entirely prevented if decay of the teeth was checked in its incipency—a further argument in favor of early treatment where prevention fails. A living tooth will never become the seat of an abscess. Only “dead teeth ulcerate.” Under no circumstances should their presence be tolerated, as their cure is usually not difficult.

The Dental Needs of School Children. As decay of the teeth is peculiarly a disease of childhood, manifesting itself as early as the third year, so it is the most common. Practically no child escapes its ravages. It may, therefore, be said without fear of contradiction that the average person who has given no attention to mouth hygiene is, at twenty years of age, from a dental standpoint, a lost cause. Certain it is that he will already have lost several teeth, while others will have become so weakened by long-neglected decay as to render the hope of permanently saving them extremely doubtful. The following case will serve to illustrate this point: While engaged in writing the foregoing paragraph, there was sent to the author by the Charity Organization Society of this city a girl of nineteen, for examination and advice as to what should be done for her in the way of mouth hygiene. An examination of her mouth revealed the fact that she had already lost seven teeth through extraction (two of them being the upper central incisors), while the decaying roots of five others were all that was visible above the gum line, meaning

that in any course of treatment these must also be extracted. In the remaining sixteen teeth (for the "wisdom teeth" had not yet erupted), there were twenty-two carious cavities requiring immediate attention if these teeth were to be saved. The whole mouth was foul in the extreme, the patient admitting that she did not use a toothbrush, as in their present condition the teeth were so sensitive as to make its use extremely painful, which was probably true. Some of the evil consequences of this long-continued neglect were already apparent, in the highly inflamed gums, enlarged tonsils and cervical lymph nodes, and in the ashy pallor so characteristic of mouth infection. Assuming that this girl could now avail herself of all that modern dentistry could give, her loss would still be an irreparable one. And when one considers the necessary time, expense and pain involved in such treatment, and compare it with the small expense and practically no pain attendant upon preventive treatment persisted in from childhood, a treatment which would have insured against the loss of a single tooth, the value of early treatment cannot but be apparent to all. This is no exceptional case. Perhaps no better proof of this could be given than that furnished by a report of an examination⁵ made of five hundred public school children applying to the Board of Health in New York City for their mercantile certificates in the spring of 1909. These children represented a large number of the public schools of the city, and it is probable that the condition of their mouths was fairly indicative of that which prevails throughout the schools of the city. It was found that not one had what might be regarded as a decently clean mouth. Four hundred and eighty-six of their number had decaying teeth, 642 of which had already been extracted, or were so badly decayed as to make extraction necessary. There were 2808 decaying teeth in their mouths, many of which could only be saved by prompt attention. But twenty-five of their number had ever been to a dentist except for tooth extraction. The use of the toothbrush was practically unknown among them. And this, it must be remembered, among children the oldest of whom was but sixteen years of age. Investigations made in other cities would seem to indicate that these figures are fairly representative of the dental needs of the children in our public schools throughout the country.

Effects of Mouth Infection Upon Child Life. As it is the child

⁵ By Wallace T. Van Winkle, D.D.S., N. Y.

who is most susceptible to caries of the teeth, so it is the child who is the greatest sufferer, and not only is this true regarding the local effect of caries, but especially is it true of its influence upon the health and efficiency of the developing child. Of the effects of mouth infection upon the health of the child, Henry G. Langworthy, M. D.,⁶ says: "Contamination of food is important in causing decay of food within the body, the poisons of which frequently cause secondary gastric catarrh, various forms of auto-intoxication, anemia, nervous debility and appendicitis. A foul mouth and decaying teeth, *particularly in children*, decidedly increase the chances of catching such contagious and infectious diseases as scarlet fever, diphtheria, measles and tuberculosis. A clean mouth will do much to prevent tubercle bacilli from gaining a foothold in the body." Not less than 40 per cent of the absentees from school are caused by toothache or other equally preventable dental ills and their sequelæ.⁷

In a public address made before the Dental Hygiene Conference held in New York City in May, 1910, Luther H. Gulick, M. D., formerly physical director of the public schools, and at present head of the Division of Child Hygiene in the Russell Sage Foundation, said that investigation had shown that it takes children with defective teeth at least six months longer to complete the eight common-school grades than it does those without defective teeth. Such observations have been made by other investigators.

Need of Public Dental Dispensaries. One thing is certain: If the teeth of the present generation are to be saved, it must be done during their school life. To defer it until they have taken upon themselves the responsibilities of adult life will be too late. Caries will already have done its work. What per cent. of the parents of the children in our public schools are able to provide adequate dental treatment for their children when taught its value, no one can tell. But whatever it may be, there will inevitably remain a vast multitude of children who must depend upon the dispensary for all needed dental treatment. And, curiously enough, there are at present no such dispensaries. Scarcely a hospital in the United States has an adequately equipped dental department. It is true there are a few dental clinics in some of our larger cities, which

⁶ Dental Cosmos. Vol. 51, page 705.

⁷ John J. Cronin, M.D., Asst. Chief Med. Insp. Div. Child Hygiene. Board of Health N. Y. City.

have sprung into being within the past few years, but not one of them is equipped to meet the needs of the community in which it is located, unless we except the one being built in Boston, and made possible by the Forsythe gift of \$1,200,000. There is not a city in the United States which does not need such a dispensary to meet the needs of the children in its own public schools. Germany has already recognized this need, and made provisions to meet it by the establishment of free dispensaries in upward of thirty of its cities, where free dental treatment is furnished to the children of the public schools. In most instances these are supported by the municipalities in which they are located.

The Need of Co-operation. Obviously, the first step toward the achievement of this much-needed reform in the United States is the education of the public in matters affecting the health of the mouth, with a view to limiting the spread of dental diseases, as far as that is possible through preventive measures, and the arrest of such as are not prevented by early treatment. The responsibility for the inauguration of such a campaign rests squarely upon the shoulders of the dental profession. It is they who know better than any other group of men the value of a clean mouth in its relation to health. As a result, there is scarcely a dental organization throughout the country—national, state or local—in which an organized effort is not being made to spread the gospel of clean mouths. But this is not enough. As a public health measure, the problem is unlike any other ever before offered for consideration. The universality of the disease, the vast numbers involved, the rapidity with which caries causes the destruction of the teeth, especially in childhood; the amount of time involved in dental operations all conspire to make its solution a difficult one. They must have, in this campaign, the co-operation of every one who has to do with child life—parent, teacher, physician, nurse, social worker—wherever he or she may be, throughout the length and breadth of the land. Nor is this enough. It is absolutely essential, if any adequate step is ever taken to meet this need, that they have the co-operation of the municipality, state and nation, for it is only through such co-operation that they can ever hope successfully to cope with the appalling conditions existing among the children of our public schools.